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INFLUENCE OF THYMUS AT THE LEVEL OF ANAPHYLACTIC SHOCK IN PORPOISES

by

Author Unknown

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Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
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К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
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М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere. When written as ë in Russian, transliterate as yë or ë. The use of diacritical marks is preferred, but such marks may be omitted when expediency dictates.

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RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English
sin	sin
cos	cos
tg	tan
ctg	cot
sec	sec
cosec	csc
sh	sinh
ch	cosh
th	tanh
cth	coth
sch	sech
csch	csch
arc sin	$\sin^{-1}$
arc cos	$\cos^{-1}$
arc tg	$\tan^{-1}$
arc ctg	$\cot^{-1}$
arc sec	$\sec^{-1}$
arc cosec	$\csc^{-1}$
arc sh	$\sinh^{-1}$
arc ch	$\cosh^{-1}$
arc th	$\tanh^{-1}$
arc cth	$\coth^{-1}$
arc sch	sech^{-1}
arc csch	csch^{-1}
rot	curl
lg	log

Influence of Thymus at the Level of Anaphylactic Shock in Porpoises

Many research studies have concluded that thymus plays an important role in the immuno-allergic reactions of the organism. Thymectomy, performed in the first few days of the newborn, removes the immune reaction of the organism and lymphocytes (1, 8, 12, 14, 17, 18, 19, 22, 25, 26, 29, 30, 31, 33, 35, 38). Besides thymectonomy performed in some animals, scientists have administered a variant synthesis of γ globulin, and found out that the ability to develop antibodies is reduced. (J. Humphrey - citation no. 9;9,15,16,23,24,31,35). Besides J. Miller, such removals of the antibodies production is not really widely accepted, and according to B. Jankovic, thymus does not directly remove the antibodies, but probably does it via the lymphatic depletion. Other data states that there is no difference in the antibody production among thymectomized and non-thymectonized animals (J. Hammar, T.H. Harris and others; L. Maciear and others, citations according to Miller). Subsequent studies showed that the superficial reaction from the varying substance disappears (11, 16, 24, 38), or it is not prominent because of the thymectonomy performed. Some scientists believe that this occurs only partially (9, 16, 38 and others). Comparatively little is known of the reaction of thymectonomy during the quick reaction of anaphylactic shock. Jankovic and Arnason (1962) published that in 50% of thymectomized newborn rats Arthur phenomenon cannot be noticed, and J. Comsa (1959, 1965), D.T. Body and S.F. Code (1963) did not succeed in noticing anaphylactic shock in animals which were thymectomized after birth; or if they did notice it it was barely noticeable, it was slow in a reduced form. Such studies and tests were made on a large number of animals (for example Comsa tested five). It is very important to note the fact that a large number of these scientists are testing mice and rats; while the general belief is that porpoises are the classical examples in which anaphylactic shock is noticeable. Lungs are the "shock organ" in porpoises in developing anaphylactic shock. It is considered that the change in the quantity of

hystamin in the lungs (2) has a continuous and important role. Such opinion is shared by Chakravartu and Brocxlohurst. In recent times, a great deal of attention has been paid to the mechanism of anaphylactic shock as a part in the reduction of active substances and as in the reduction of mediators: hystamin; heparin; 5-HT; bradyquinine; properdin; acetylocholin and others (Rocha and Silva - citation according to 2; J. Riley Dale, citation according to 3, and 28). Another line of thinking is becoming widely applied. It is that, even though and unnecessarily uniform, hystamin is the most constant in larger dosages and it controls the degree of the shock. Besides that, A.D. Ado (1964) discovered that acetylocholin and 5-HT in the lungs of a thymectomized porpoise plays practically no role at all. Besides Kato and Cozsy (1956), hystamin is a physiological stimulator of phagocytosis which in turn is a "phaze in immunology", and consequently hystamin reacts as an antibody production organ and could serve as an indicator of the intensity of antigen-antibody reaction during the anaphylactic shock. This does not give me the basis on which I can assume that hystamin in lungs of porpoises would be a necessary indicator of thymectonomy at the level of the anaphylactic shock. The aim of this report is to study and further research the influence of thymectonomy performed in different age brackets of animals during the height of the development of anaphylactic shock in porpoises.

Material and Method

98 porpoises were used in this experiment. They were divided into three different groups: 39 newborn; 39, 15-20 days old; and 20 grown animals. 30 calves in the newborn groups were thymectomized during the first ten to twenty days since birth. Nine other calves were left to be used as a control. The second group was formed on the basis which many scientists consider 15-20 days old animals to be as a border-line, in which thymectonomy is not reflected during the immunity reaction of the entire organism. 29 porpoises from that group were thymectomized within 15-20 days since birth, and 10 were

left as a control to be used for comparison. In the last group, 13 porpoises were thymectomized and 7 were left alone, in order that thymectonomy could be studied in full grown porpoises (Table 1). Porpoises were sensitized on the 30th day after thymectonomy with 0.10 ml of undilluted hose serum, injected under the skin. The shock reaction was reflected in a typical clinical picture, and after its reaction passed, death occured within two to three minutes; delayed shock and death within 25-30 minutes. Hystamin was determined in those dying from shock and in those which did not develop the shock. Total hystamin was extracted according to the Tabor method, modified by D. Zheliazkov and P. Uzunov.

Групи 1	Брой 2	Неразвили шок или протрахиран 3		Хистамин в γ на 1 г тъкан 6
		брой 4	процент 5	
I. Новородени тимектомирани	30	9	30	13,8 γ
Контролни 7	9	1	11,1	16,1 γ
II. 15—20-дневни тимектомирани	29	—	—	7,9 γ
Контролни 8	10	—	—	9,7 γ
III. Възрастни тимектомирани	18	4	30,7	9,2 γ
Контролни 9	7	2	28,5	11,0 γ

Table 1. Number of porpoises which did not develop a shock after a variant dose. Key: 1) group, 2) number, 3) did not develop a shock, 4) number, 5) percent, 6) hystamine and γ per 1 gram of tissue, 7) new-born thymectomized control, 8) 15-20 day thymectomized control, 9) full grown thymectomized controls.

Results and Discussions

From 30 newborn thymectomized and sensitized porpoises, nine did not experience or live through the anaphylactic shock because of the injected antidose (Table 1). This represents 30% in survival; statistically presented ($P_{(t)} > 0.99$) in comparison with porpoises which were left for control, and out of which only one porpoise did not develop

a shock. This fact indicates that an early thymectonomy does not permit the development of anaphylactic reaction in one group of porpoises. Each 15-20 day old porpoise developed a shock and died 3-4 minutes after the prescribed shot was administered. In the group of full-grown porpoises, 4 out of 13, which were thymectomized, did not develop anaphylactic shock (30.7%), and 2 out from the control group also did not develop the shock (28.5%). Juxtaposed data indicate that a difference is found in the marginal statistical error. The lack of anaphylactic reaction in one group of porpoises is difficult to connect with the increase thymus involution.

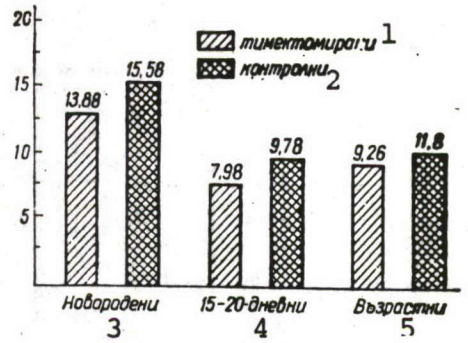

Figure 1. Key: 1) thymectomized, 2) control, 3) new-born, 4) 15-20 days old, 5) full grown.

This is probably so in connection with the age bracket, but not clear from the given literature, that one part of a grown porpoise does not develop an anaphylactic reaction. Data depending on the quantity of hystamin in the lungs shows that thymectonomy, regardless at what age it was administered, indicates a somewhat small decrease in the total amount of hystamin, as compared with the group of porpoises left for control (Diagram 1). These differences are statistically presented as ($P_{(t)}$>0.90) in the group of newborn, and with ($P_{(t)}$>0.90) in the group of those 15-20 days old, and with ($P_{(t)}$>0.90) in the group of full grown porpoises. This fact shows that thymectonomy performed shortly after birth does not indicate a demonstrative clinical change in allergic reaction; it does not indicate a demonstrative clinical

change in allergic reaction; it does not indicate an equal reaction of hystamin in the lungs among the sensitized and those injected with a prescribed dose of horse serum. This fact gives a basis upon which one can suppose that even a weak anaphylactic reaction can be connected with the involution of thymus, and it cannot be labelled as an equalizer between thymectonomy and a natural involution of thymus. An individual comparison of the total amount of hystamin in the lungs shows that in animals which did not chemically indicate any anaphylactic reaction, this hystamin reacted only a bit, as compared with those animals which developed the shock. These conclusions show that anaphylactic shock depends on the amount of hystamin in the lungs. An interesting fact is presented, that the sensitized animals which died because of the shock, showed large quantities of hystamin in lungs (14.7 σ) from which the shock picture is developed (10.1 σ). This data supports the data of Watanabe and can serve as a supporter of the hypothesis that during the development of the anaphylactic reaction, hystamin flows into the blood. It is probable that during the experiment, a lot is devoted to the hystamin controlling enzymes and to the relationship between the active and passive forms of hystamin in the lungs. Our data shows an undisputed influence of thymectonomy administered to different age groups and on the content of hystamin in the lungs before and during the variant injection to sensitized porpoises. This gives basis for decreasing the degree of anaphylactic shock reaction in connection with the content of hystamin in lungs, which is rather large in nonthymectomized animals, demonstratively shown in the group of new-born porpoises.

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